

ADAPTIVE ANALYSIS TECHNIQUE FOR
PLANNING OFFICE LAYOUT

Cross Reference to Related Applications

This application is related to application Serial Number 09/604,535 to

5 Levanoni, et al. (IBM Docket YOR920000425US1) filed June 27, 2000; to
application Serial Number 09/612,683 to Levanoni, et al. (IBM Docket
YOR920000446US1) filed July 10, 2000; to application Serial Number
09/633,830 to Levanoni, et al. (IBM Docket YOR920000508US1) filed August 7,
2000; to application Serial Number 09/696,552 to Levanoni, et al. (IBM Docket
10 YOR920000590US1) filed October 25, 2000; and to application Serial
Number _____ to Levanoni, et al. (IBM Docket YOR920030568US1) filed
on even date. Each of these applications is co-pending and commonly assigned.

BACKGROUND OF THE INVENTION

Field of the Invention

15 This invention relates to methodology and apparatus for utilizing adaptive
analysis techniques in the area of office layout.

Introduction to the Invention

Adaptive analysis techniques are known and include disparate technologies, including neural networks, which can work to an end of efficiently discovering valuable, non-obvious information from a large collection of data.

- 5 The data, in turn, may arise in fields ranging from e.g., marketing, finance, manufacturing, or retail.

Summary of the Invention

We have now discovered novel methodology for exploiting the advantages inherent generally in adaptive analysis technologies, in the particular field of
10 office layout applications.

Our work proceeds in the following way.

Normally, an office designer develops a requirements database comprising a compendium of office requirements history -- e.g., the requirement's correlation to geographical layout. Secondly, and independently, the office
15 designer develops in his mind an office database comprising the office designer's personal, partial, and subjective knowledge of objective office facts culled from e.g., the marketing literature, the business literature, or input from colleagues or salespersons. Thirdly, the office designer subjectively correlates in his mind the necessarily incomplete and partial office database, with the requirements

database, in order to promulgate an individual's requirements prescribed office layout evaluation and selection.

This approach is part science and part art, and captures one aspect of the problems associated with office placement. However, as suggested above, it is manifestly a subjective paradigm, and therefore open to human vagaries.

We now disclose a novel computer method which can preserve the advantages inherent in the abovementioned approach, while minimizing the incompleteness and attendant subjectivities that otherwise inure in a technique heretofore entirely reserved for human realization.

To this end, in a first aspect of the present invention, we disclose a novel computer method comprising the steps of:

- i) providing a requirements database comprising a compendium of office requirements history;
- ii) providing an office database comprising a compendium of at least one of office layout solutions, office information, and office diagnostics;
- and
- iii) employing an adaptive analysis technique for interrogating said requirements and office databases for generating an output data stream, said output data stream correlating office requirements history with office layout solution.

The novel method preferably comprises a further step of updating the
step i) requirements database, so that it can cumulatively track the requirements
history as it develops over time. For example, this step i) of updating the
requirements database may include the results of employing the step iii) adaptive
5 analysis technique. Also, the method may comprise a step of refining an
employed adaptive analysis technique in cognizance of pattern changes
embedded in each database as a consequence of distribution results and
updating the requirements database.

The novel method preferably comprises a further step of updating the step
10 ii) office database, so that it can cumulatively track an ever increasing and
developing technical office management literature. For example, this step ii) of
updating the office database may include the effects of employing an adaptive
analysis technique on the requirements database. Also, the method may
comprise a step of refining an employed adaptive analysis technique in
15 cognizance of pattern changes embedded in each database as a consequence
of office geography results and updating the office database.

The novel method may employ advantageously a wide array of step iii)
adaptive analysis techniques for interrogating the requirements and office
database for generating an output data stream, which output data stream
20 correlates requirements problem with office layout solution. For example, the
adaptive analysis technique may comprise inter alia employment of the following

functions for producing output data: classification-neural, classification-tree, clustering-geoographic, clustering-neural, factor analysis, or principal component analysis, or expert systems.

In a second aspect of the present invention, we disclose a program storage device readable by machine to perform method steps for providing an interactive office management database, the method comprising the steps of:

- i) providing a requirements database comprising a compendium of office requirements history;
 - ii) providing an office database comprising a compendium of at least one of office layout solutions, office information, and office diagnostics;
- and
- iii) employing an adaptive analysis technique for interrogating said requirements and office databases for generating an output data stream, said output data stream correlating office requirements history with office layout solution.

In a third aspect of the present invention, we disclose a computer comprising:

- i) means for inputting a requirements database comprising a compendium of office requirements history;

- ii) means for inputting an office database comprising a compendium of at least one of office layout solutions, office information, and office diagnostics;
 - iii) means for employing an adaptive analysis technique for interrogating said requirements and office databases;
- 5 and
- iv) means for generating an output data stream, said output data stream correlating requirements history with office layout solution.

We have now summarized the invention in several of its aspects or
10 manifestations. It may be observed, in sharp contrast with the prior art discussed above comprising the three-part subjective paradigm approach to the problem of planning office layout, that the summarized invention utilizes inter alia, the technique of adaptive analysis.

We now point out, firstly, that the technique of adaptive analysis is of such
15 complexity and utility, that as a technique, in and of itself, it cannot be used in any way as an available candidate solution for planning office layout, to the extent that the problem of planning office layout is only approached within the realm of the human-subjective solution to planning office layout. Moreover, to the extent that the present invention uses computer techniques including e.g.,

adaptive analysis techniques, to an end of solving a problem of planning office layout, it is not in general obvious, within the nominal context of the problem and the technique of adaptive analysis, how they are in fact to be brought into relationship in order to provide a pragmatic solution to the problem of planning office layout. It is, rather, an aspect of the novelty and unobviousness of the present invention that it discloses, on the one hand, the possibility for using the technique of adaptive analysis within the context of planning office layout, and, moreover, on the other hand, discloses illustrative methodology that is required to in fact pragmatically bring the technique of adaptive analysis to bear on the actuality of solving the problem of planning office layout.

Brief Description of the Drawing

The invention is illustrated in the accompanying drawing, in which

Fig. 1 provides an illustrative flowchart comprehending overall realization of the method of the present invention;

Fig. 2 provides an illustrative flowchart of details comprehended in the Fig. 1 flowchart;

Fig. 3 shows a neural network that may be used in realization of the Figs. 1 and 2 adaptive analysis algorithm;
and

Fig. 4 shows further illustrative refinements of the Fig. 3 neural network.

Detailed Description of the Present Invention

The detailed description of the present invention proceeds by tracing through three quintessential method steps, summarized above, that fairly capture the invention in all its sundry aspects. To this end, attention is directed to the flowcharts and neural networks of Figures 1 through 4, which can provide enablement of the three method steps.

Figure 1, numerals 10-18, illustratively captures the overall spirit of the present invention. In particular, the fig. 1 flowchart (10) shows a requirements database (12) comprising a compendium of individual requirements history, and an office database (14) comprising a compendium of at least one of office layout solution, office information, and office diagnostics. Those skilled in the art will have no difficulty, having regard to their own knowledge and this disclosure, in creating or updating the databases (12,14) e.g., conventional techniques can be used to this end.

Fig. 1 also shows the outputs of the requirements database (12) and office database (14) input to an adaptive analysis condition algorithm box (16). The adaptive analysis algorithm can interrogate the information captured and/or updated in the requirements and office databases (12,14), and can generate an output data stream (18) correlating requirements problem with office layout solution. Note that the output (18) of the adaptive analysis algorithm can be

most advantageously, self-reflexively, fed as a subsequent input to at least one of the requirements database (12), the office database (14), and the adaptive analysis correlation algorithm (16).

Attention is now directed to Fig. 2, which provides a flowchart (20-42) that
5 recapitulates some of the Fig. 1 flowchart information, but adds particulars on the immediate correlation functionalities required of an adaptive analysis correlation algorithm. For illustrative purposes, Fig. 2 comprehends the adaptive analysis correlation algorithm as a neural-net based classification of requirements features, e.g., wherein a requirements feature for say, conferencing
10 requirements, may include location information such as geography, demographics, current local weather information, expected requirements by week, etc.

Fig. 3, in turn, shows a neural-net (44) that may be used in realization of the Figs. 1 and 2 adaptive analysis correlation algorithm. Note the reference to
15 classes which represent classification of input features. The Fig. 3 neural-net (44) in turn, may be advantageously refined, as shown in the Fig. 4 neural-net (46), to capture the self-reflexive capabilities of the present invention, as elaborated above.